

IN THE CLAIMS

Claims 1-130 are presented below:

Claims 1-111 (canceled).

112. (Currently Amended) A method of forming a barrier metal film formed of a nitride film including tungsten by thermal CVD, comprising:

positioning a substrate in a processing vessel;

maintaining a ~~predetermined~~ pressure in the processing vessel;

forming a film containing tungsten on one side of the substrate by supplying a process gas including WF<sub>6</sub> gas and SiH<sub>4</sub> gas into the processing vessel;

shutting off the supplying of the ~~WF<sub>6</sub> gas and SiH<sub>4</sub> process~~ gas into the processing vessel;

removing ~~WF<sub>6</sub> the process~~ gas from the processing vessel by supplying a purging gas into the processing vessel, while evacuating the processing vessel; and

nitriding the film containing tungsten by supplying a NH<sub>3</sub> gas ~~containing nitrogen~~.

113. (Currently Amended) The method according to Claim 112, wherein the nitriding of the film is performed by generating plasmas ~~with the gas containing nitrogen~~.

114. (Previously Presented) The method according to Claim 112, wherein the forming of the film and nitriding of the film are performed in the same processing apparatus or different processing apparatus.

115. (Currently Amended) The method according to Claim 112, ~~wherein the gas containing nitrogen includes wherein said nitriding comprises supplying at least one of NH<sub>3</sub>, MMH, MMH and N<sub>2</sub>.~~

116. (Previously Presented) The method according to Claim 112, wherein the film containing tungsten is formed at a temperature of about 300 to 450°C and on a pressure of about 0.5 to 80 Torr.

117. (Previously Presented) The method according to Claim 112, wherein the film containing tungsten is made of W or ~~Wsix WSix~~.

118. (Previously Presented) The method according to Claim 112, wherein the nitriding of the film is performed by using MMH gas under following process conditions:  
an amount of MMH gas: about 1-20 sccm,  
temperature: about 300-450°C,  
pressure: about 0.1-5 Torr.

119. (Previously Presented) The method according to Claim 112, wherein the nitriding of the film is performed by using N<sub>2</sub> gas under following process conditions:  
an amount of N<sub>2</sub> gas: about 50-300 sccm,

temperature: about 300-450°C,

pressure: about 0.1-5 Torr.

120. (Currently Amended) The method according to Claim 112, wherein the film containing tungsten is made of ~~W<sub>n</sub>x~~ WN<sub>x</sub> or ~~W<sub>six</sub>N<sub>y</sub>~~ WSixNy.

121. (Currently Amended) A method of forming a barrier metal film formed of a nitride film including tungsten by thermal CVD, comprising:

positioning a substrate in a processing vessel;

maintaining a ~~predetermined~~ pressure in the processing vessel;

forming a film containing tungsten on one side of the substrate by supplying a gas containing tungsten and a gas containing hydrogen into the processing vessel;

shutting off the supplying of the gas containing tungsten and gas containing hydrogen into the processing vessel;

removing the gas containing tungsten from the processing vessel by supplying an inert gas as a purging gas into the processing vessel, while evacuating the processing vessel; and  
nitriding the film containing tungsten by supplying a NH<sub>3</sub> gas ~~containing nitrogen~~.

122. (Currently Amended) The method according to Claim 121, wherein the nitriding of the film is performed by generating plasma ~~with the gas containing nitrogen~~.

123. (Currently Amended) The method according to Claim 121, wherein said nitriding comprises supplying the gas containing nitride includes at least one of NH<sub>3</sub>, MMH, and N<sub>2</sub>.

124. (Previously Presented) The method according to Claim 121, wherein the gas containing H<sub>2</sub> includes at least one of H<sub>2</sub> gas, SiH<sub>4</sub> gas, Si<sub>2</sub>H<sub>6</sub> gas, and SiH<sub>2</sub>Cl<sub>2</sub> gas.

125. (Previously Presented) The method according to Claim 121, wherein the film containing tungsten is formed at a temperature of about 300 to 450°C and on a pressure of about 1.0 to 80 Torr.

126. (Currently Amended) A method of forming a barrier metal film formed of a nitride film including tungsten by thermal CVD comprising:

positioning a substrate in a processing vessel;

maintaining a predetermined pressure in the processing vessel;

forming a film containing tungsten on one side of the substrate by supplying a WF<sub>6</sub> gas and SiH<sub>4</sub> gas or H<sub>2</sub> gas into the processing vessel;

shutting off the supplying of the WF<sub>6</sub> gas and SiH<sub>4</sub> gas or H<sub>2</sub> gas into the processing vessel;

removing the WF<sub>6</sub> gas from the processing vessel by supplying an inert gas as a purging gas into the processing vessel, while evacuating the processing vessel; and

nitriding the film containing tungsten by supplying a gas containing nitrogen at least one of NH<sub>3</sub> and N<sub>2</sub> and forming a plasma of the gas containing nitrogen at least one of NH<sub>3</sub> and N<sub>2</sub>.

127. (Currently Amended) The method according to claim 126, wherein said nitriding comprises supplying the gas containing nitride includes at least one of NH<sub>3</sub>, MMH, and N<sub>2</sub>.

128. (Previously Presented) The method according to Claim 126, wherein the film containing tungsten is formed at a temperature of about 300 to 450°C.

129. (New) The method according to claim 112, wherein a polysilicon layer is formed on a gate insulating film formed on the substrate, the film containing tungsten being formed on the polysilicon layer.

130. (New) The method according to claim 112, wherein an insulating layer is formed on the substrate, the film containing tungsten being formed on the insulating layer.